



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 1 156 226 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
21.11.2001 Bulletin 2001/47

(51) Int Cl.7: **F16B 12/20, F16B 12/26**

(21) Application number: **01100632.7**

(22) Date of filing: **11.01.2001**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE TR**
Designated Extension States:
AL LT LV MK RO SI

(72) Inventor: **Destro, Gianfranco**
35100 Padova (IT)

(74) Representative: **Porsia, Attilio, Dr.**
c/o Succ. Ing. Fischetti & Weber
Via Caffaro 3/2
16124 Genova (IT)

(30) Priority: **16.05.2000 IT BO000288**

(71) Applicant: **Destro, Gianfranco**
35100 Padova (IT)

(54) **Joint for the quick and reversible connection of two parts of a piece of furniture in square with each other**

(57) The rotating bolt (9) is assembled in the seat (3) of the joint bush (1), so that its tooth (309) projects perpendicularly into the cavity or female (U) of the bush itself. The tooth (309) is characterized by a wedge-shaped outline, with a lower inclined plane which in the phase of the insertion of the bush female onto the male (M) of the joint bracket (12), co-operates with said male which makes it move back, even because said bolt is assembled in its own seat so to be able in case of need to perform an oscillation and/or a translation allowing said tooth to move away from the female of the joint, in contrast with the action of elastic means (6). In the phase of insertion of the bush onto the joint bracket, the bolt (9) tooth is then able to automatically snap into the seat (15) of the male (M). The bolt (9) is provided on the opposite ends with carvings (10, 10') in order, in case of need, to be rotated by means of a tool inserted through an hole (16) of the base of the bracket (12) or through a hole (11) open on the upper face of the plane (R) having the bush (1) of the joint.

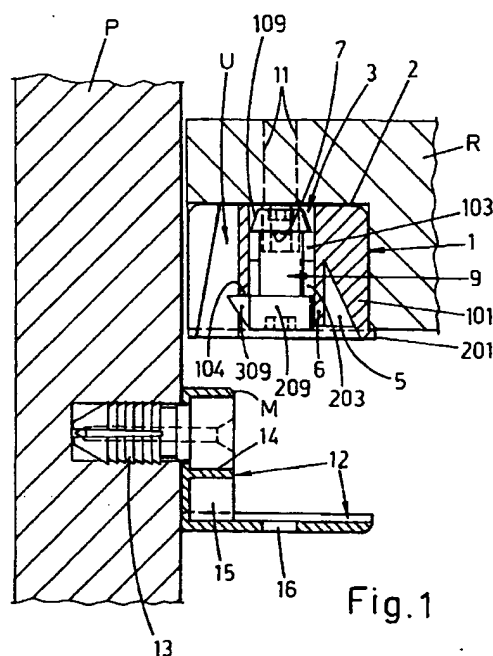


Fig.1

EP 1 156 226 A1

Description

[0001] The present invention refers to a joint for the quick and reversible connection of two parts of a piece of furniture positioned in square with each other, particularly for the connection of horizontal planes to the vertical walls of a piece of furniture. There are known devices for this aim, provided with a "L" shaped, usually "zama" alloy bracket, which is fixed on the piece of furniture vertical wall, being the vertical part of said bracket shaped so to embody the wedge-shaped and progressive setting male of a dovetail joint. In connection with the side of the plane to be fixed onto said vertical wall of the piece of furniture, on the lower face of the same plane is obtained a vertical and dead hole, which is partially open on the adjacent vertical side of the plane and into which is inserted by pressure a bush usually of plastic, provided by the side with anti-take off reliefs and having open on the side turned to said vertical side and on the plane lower surface, a cavity or vertical female, with dovetail outline and with a shape complementary to the one of the male of said bracket. Fitting together the two complementary parts of the joint, the horizontal plane is fixed to the vertical wall of the piece of furniture, with the bush resting on the bracket horizontal base.

[0002] To avoid the accidental lifting of the horizontal planes of the piece of furniture, it is known to fix the bush to the bracket and said fixing is actually made with screws, or through a door bolt rotably assembled in the bush, accessible through an hole of the horizontal base of the bracket and such to hook a recess provided in the vertical male of the same bracket. The rotating bolt is normally provided for the operating by means of screwdriver from both ends, so that in case the device in question is assembled on a plane very close to the floor said bolt can be accessed from above through a little hole open on the upper face of said plane. These solutions, with rotating fixing parts, offer the advantage of having a functioning easy to understand even by who is not expert in the field and in the future will have to open the joint, but have nevertheless the disadvantage of a long time of activation in the fixing of the horizontal planes to the vertical walls of the piece of furniture.

[0003] To avoid these disadvantages, joints of the type above described are known, where the bush is provided with a tooth assembled on a flexible tongue which by the coupling of the vertical female of the bush itself to the male of the bracket, hooks automatically to a recess provided on the same male. To open this type of joint it is necessary to work with the point of a screwdriver on said flexible tongue with the hooking tooth, to move it away from its hooking seat. These type of joints, although on one side they have the advantage of the assembly easiness and quickness, on the other side they have the disadvantage of a difficult understanding of the functioning by the persons with little experience who in the future could have to disassembly the piece of furniture and have the disadvantage of showing a lack of re-

liability, because of the precariousness of the hook of the plastic tooth of the flexible tongue with the seat of the metal bracket.

[0004] The invention aim to obviate these and other disadvantages of the known technique, through the following solution idea. The bush is provided with a rotating door bolt which has the tooth turned to the position for the fixing to the bracket seat and has the tooth itself with a wedge shaped outline, and a tapered lower part. The bolt is then assembled in its own seat with the possibility to oscillate in contrast with an elastic mean, so that its tooth snaps into the seat of the bracket when onto this one is inserted the bush female. To open the joint, when it is necessary to disassemble the planes of the piece of furniture, it is sufficient to turn the bolt to a preferably obliged direction.

[0005] Other features of the invention, ad the consequent advantages, will be better cleared by the following description of a preferred embodiment form of the same invention, shown as a mere not limitative example in the figures of the two enclosed drawing plates, where:

- figs. 1, 2 and 3 are side views and with parts in section of the two joint parts assembled on their respective components of the piece of furniture and shown respectively before the coupling, in the coupling phase and by coupling already made;
- figs. 4 and 5 are respectively bottom and top plan views of the bush of the joint in question;
- fig. 6 shows some details of the bush sectioned according to the line VI-VI of figure 5;
- fig. 7 is a perspective view of the bush rotating bolt;
- figs. 8 and 9 are partial and bottom plan views of the bush with little embodiment changes.

[0006] From figures 1, 4, 5 and 6 it is noticed that the bush 1 is made of suitable plastic material and includes a cylindrical shaped body 101, provided sideways of reliefs 301 with an anti-take off outline, which keep the bush itself in the housing dead hole 2 obtained on the lower face of the horizontal plane R of the piece of furniture, on which said body 101 rests with an end collar 201. The housing hole 2 is partially open on the head surface with which the plane R is joined to the vertical wall P of the piece of furniture, so that the bush has in sight, through said opening of the hole 2, the levelled part where is open the cavity or female U of the wedge shaped and dovetail joint of the bush, turned so to converge upwards.

[0007] The bush 1 is axially or parallel as to its axis provided with a seat 3 which is open on the face turned upwards of the bush itself, with a cylindrical and round section part 103 (figs. 1, 5) and which is instead open on the opposite face of the same bush, with a square section part 203 circumscribing said part 103 (figs. 1, 4). On the same lower face, the bush has an L shaped recess 4, having suitably depth, and open with the side 104 in the female U of the same bush. In contrast with

said open side 104 of the recess 4, the bush has on the lower face a recess 5 for instance with a circle sector plan or other suitable shape, having the same depth of the part 203 of said seat 3 and giving to the close wall 6 of said part, suitable flexibility characteristics (see later on).

[0008] In the cylindrical part 103 of said seat 3 (figs. 5, 6) it projects teeth, identical, opposite and on the same plane 7, 7', with wedge outline, tapered downwards, integral by portions 107, 107' of the bush body, they are tongue shaped and made flexible by being bordered by recesses 8, 8' open besides on the bush upper face, also in the part 103 of the seat 3. The teeth 7, 7' are positioned on a common ideal plane which is parallel to the open side 104 of the recess 4 (figs. 4, 5).

[0009] In the seat 3 of the bush 1, it is inserted from the bottom a cylindrical cask or bolt 9 as shown in figure 7, made for example of "zama" alloy and characterized by the fact it has a frustum of cone head 109 provided on the lower base and in sight with a recess 10 for the operating by means of screwdriver and characterized by the fact it has a reinforced base 209, for example having cylindrical shape, provided with a radially extending tooth 309 with wedge-shaped outline and lower side oblique said base being provided on the lower face with a recess 10' analogous to the 10 one (fig. 4). The head largest part and the base of the bolt 9 have for example a diameter substantially equal to the one of the part 103 of the seat 3 and the bolt itself is dimensioned and orientated so that in the phase of insertion into the seat 3, its head 109 snaps on the teeth 7, 7' of the bush 1 and the tooth 309 rests on the open side of the recess 4, while the base 209 is supported by the wall 6, as shown in figures 1, 4 and 5.

[0010] If the plane R of the piece of furniture is destined to be positioned close to the floor, the same plane can be eventually provided with an hole 11 (fig. 1) upwardly open, to allow in case of need the actuating from above of the bolt 9.

[0011] In figure 1, with 12 is indicated the bracket, usually of "zama" alloy and with L shaped side outline, having vertically the male M of the wedge-shaped and dovetail joint system, complementary to the female U of the bush. The bracket is fixed to the male M on the vertical Wall P of the piece of furniture, for example with a screw or an expansion plug 13 of the known type, housed with the head in a through seat 14 obtained on the same male M. Under this seat, the male M has in sight a seat 15 having at least the upper side horizontally oriented.

[0012] The base of the bracket 12 is provided with an hole 16.

[0013] When the bush 1 is assembled with the female U onto the male M of the bracket 12, as shown subsequently in figures 2 and 3, the inclined plane of the bolt 9 tooth 309 co-operates with the front part in sight of the same male M and makes said bolt oscillate in contrast with the wall 6 which bends and moves into the recess

5. The bolt makes fulcrum with its head 109 on the teeth 7, 7' and with its base moves away from the male M, allowing the tooth 309 to creep to the front in sight of said male. When the insertion of the bush is completed, the tooth 309 comes to connection with the male M seat 15 and snaps into said seat under the pushing of the wall 6 which for elastic memory comes back to the initial position. In this way the bush is locked to the bracket 12, without further operations. The lock proves to be absolutely reliable since it is obtained through the co-operation between metal parts. It is all the same agreed that the bolt 9 can also be made in suitable plastic material.

[0014] To open the joint as described, it is sufficient to give a ninety degrees turning to the bolt 9, by inserting a screwdriver into the hole 16 or into the hole 11, to operate on the lower carving 10' or on the upper one 10 of the same bolt. The bolt turning is in a fixed direction and leads to the moving back of its tooth 309 into the recess 4 side part, as shown in figure 4 with dotted line. Under this condition the bush 1 can be taken off from the bracket 12 and the plane R of the piece of furniture can be unlocked from the wall P.

[0015] In order to keep the bolt 9 tooth 309 in the orientation useful for the snapping into the seat 15 of the bracket 12, the base 209 of the same bolt can be provided, in opposition with said tooth and parallel to its own axis, with a ribbing in relief 17 (figs. 7, 8) which for example houses in a little recess obtained by a median cut 18 dividing into two equal parts the wall 6 of contrast to the oscillation of the same bolt in the phase of figure 2. This same condition can be differently ensured by the co-operation of a levelled part 19 of the bolt base 209 with the flexible wall 6, which as shown in figure 9 can be made more flexible through cuts 20 which separate both the ends from the bush body. Figure 8 shown also the variation according to which the bolt tooth 309, in the active position, leans with one of its sides against a shoulder 303 of the seat 203 part. This condition helps to keep the tooth 309 correctly orientated in the female U of the bush and so the rotation of the bolt for the deactivation of the same tooth 309, can be performed just counterclockwise according to figure 8, so that the person who has to open the joint in question is not disorientated.

Obviously, the protection field of the present patent application extends also to those joints where the bush 1 is inserted into a dead and horizontal hole obtained on the head vertical wall of the plane R of the piece of furniture and has the female U on its own base in sight, the whole in a way intuitive and easily to embody by the technicians of the filed. Other variations can be referred to the fact that the seat 3 housing the rotating bolt can be arranged to make the same bolt translate, instead of oscillating or besides such a movement, a movement always in contrast with the action of said elastic means obtained integrally or put on the bush 1.

Claims

1. Joint for the quick and reversible connection of two parts of a piece of furniture in square with each other, for instance for the connection of an horizontal plane (R) and a vertical wall (P), provided with a bush (1) usually made of plastic material, which is inserted into a dead hole of said plane (R) and which is partially visible on the head of the same plane, where it shows the cavity or female (U) of a dovetail joint, which can be inserted onto the complementary male (M) of a bracket (12), usually made of metal, fixed with the male itself vertically on said vertical wall (P) of the piece of furniture and on whose base rests said bush provided with a seat axial or parallel to its own axis, which rotably houses a bolt, usually made of metal, at its turn provided at its ends with carvings (10, 10') for the actuating by means of a tool inserted through an hole (16) of said bracket (12) base or trough an hole (11) made on the plane of the piece of furniture (R), being said bolt provided with a radial tooth (309) which after the rotation of the same bolt can be inserted into and removed from a seat (15) of the bracket (12) male, **characterized in that** said bolt is assembled in its own seat (3) so that its tooth (309) projects perpendicularly into the female (U) of the bush, being said tooth **characterized by** a wedge-shaped outline, with an inclined lower plane which, in the phase of insertion of the female (U) of the bush onto the male (M) of the joint bracket (12), co-operates with said male which makes it move back since said bolt is assembled in its own seat to be able to perform in case of need an oscillation and/or a translation allowing said tooth to move away from said bush female (U), in contrast with the action of elastic means (6), this all in a way that during the insertion of the bush onto the joint bracket, the bolt tooth snaps automatically in the male (M) seat (15).
2. A joint according to claim 1, where the rotating bolt (9) is assembled in its own seat so that with the end opposed to the one provided with the hooking tooth (309), can perform in said seat an oscillation around an orthogonal axis to said tooth, while with the other end provided with the hooking tooth (309) it co-operates with an elastic mean (6) which gives way in the phase where the female (U) of the bush (1) is inserted onto the male (M) of the bracket (12).
3. A joint according to claim 2, where the elastic mean is at least a flexible wall or tongue (6) integrally obtained on the bush (1) body.
4. A Joint according to the preceding claims, where the bolt (9) is provided with a frustum of cone head (109) having on its smallest face and in sight a carving (10) for its driving by means of a screwdriver, and it is provided on the other end of a cylindrical base (209) having for example the same diameter of the largest part of said head, provided with a carving (10') for its driving by means of a screwdriver and having integrally obtained the radial and wedge-shaped tooth (309), being the seat (3) of the bush, which rotably houses the bolt, provided with a cylindrical upper part (103), with a diameter almost equal to the one of the largest part of said bolt head (109), in said part projecting opposed and wedge-shaped teeth (7, 7') with which snaps said bolt head, being said teeth on a plan ideally parallel to the transversal direction of the female (U) of the bush and being integral with parts of the wall of said seat part, said parts being made flexible as tongues (107, 107'), by adjacent recesses (8, 8') obtained in the bush body, being the remaining part (203) of the seat housing the bolt, provided with a conformation with substantially square plan and such to circumscribe said round section part (103) and on the lower face of the bush said last part of seat is partially delimited by an L plan recess (4), on whose side (104), which is open into the bush female (U), normally rests the tooth (309) of the rotating bolt (9), while the other side of said recess has a width such that in it can be inserted said tooth when the bolt is turned at 90°, being provided in opposition with said open side (104) of said recess (4), a recess (5) as well open on the bush lower face, which gives flexibility characteristics to the wall (6) of said last seat part (203) which elastically co-operates with the bolt to allow the oscillation during the coupling of the bush with the joint bracket.
5. A joint according to claim 4, where the flexible wall (6) of the seat part (203) housing the rotating bolt (9) is longitudinally provided with a median cut (18) which improves the flexibility of said wall.
6. A joint according to claim 5, **characterized in that** with the median cut (18) of the flexible wall (6) of the seat part (203) which houses the rotating bolt (9), co-operates a longitudinal relief (17) of the base reinforcement (209) of the same bolt (9), in order to normally keep the tooth (309) of the same bolt in the correct position projecting into the female (U) of the bush (1).
7. A joint according to claim 4, where the flexible wall (6) of the last seat part (203) housing the rotating bolt (9), is provided longitudinally and at the opposite ends, with cuts (20) improving the flexibility of said wall.
8. A joint according to claim 4, where the reinforced base (209) of the rotating bolt (9) is provided with a secant levelling (19) leaning against the flexible wall (6) of the last seat part (203) housing the same bolt,

in order to normally keep the tooth (309) of the same bolt in the correct position projecting into the female (U) of the bush (1).

9. A joint according to claim 4, where the tooth (309) of the rotating bolt (9), when it is in the active position, leans with one of its sides against a shoulder (303) of the seat (203) part housing the base of the bolt itself.

10

15

20

25

30

35

40

45

50

55

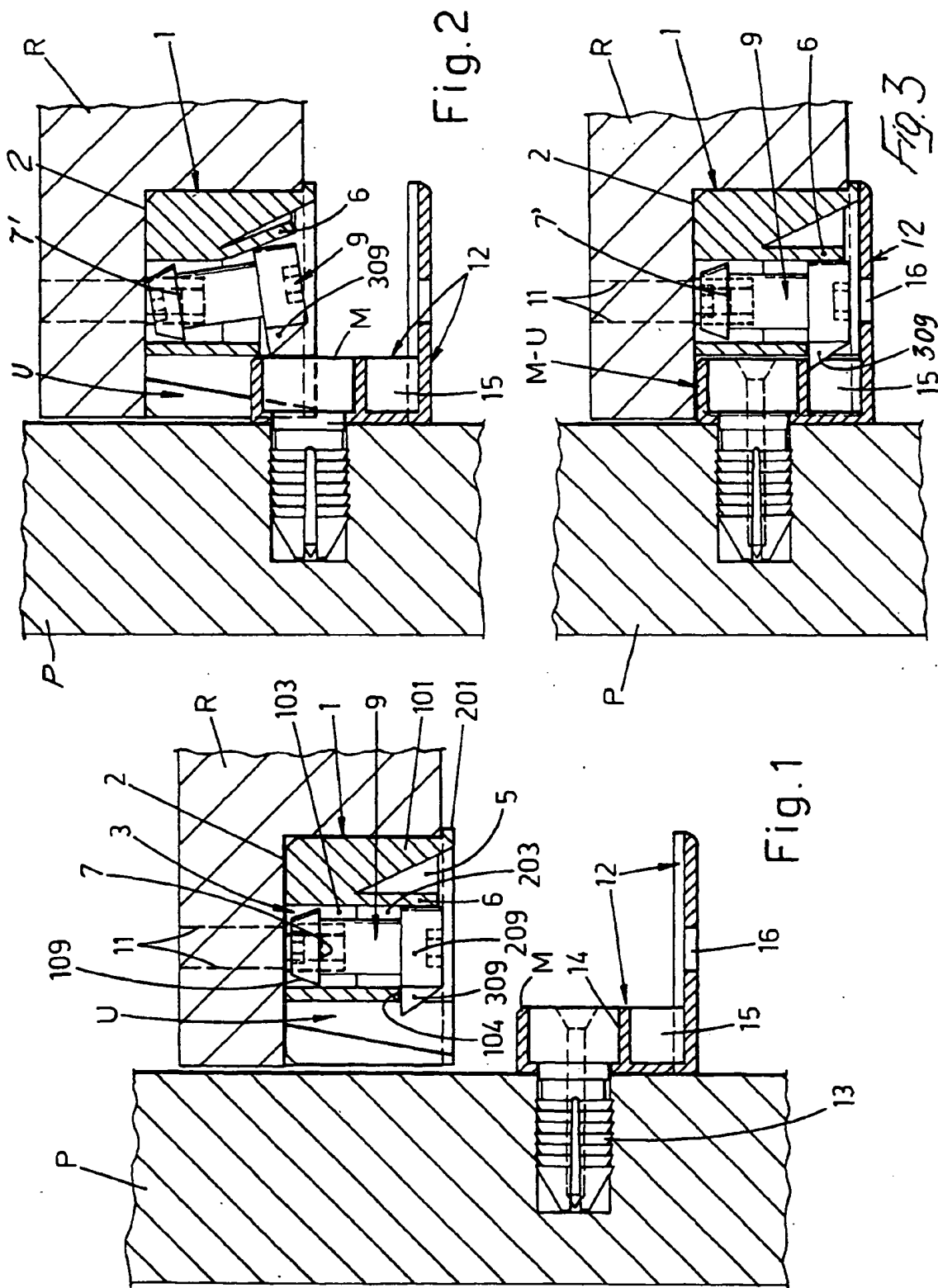
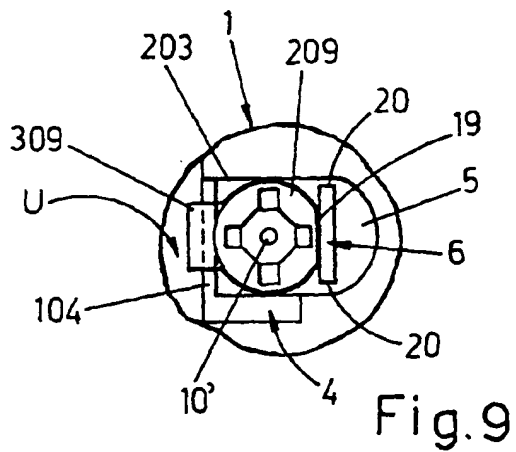
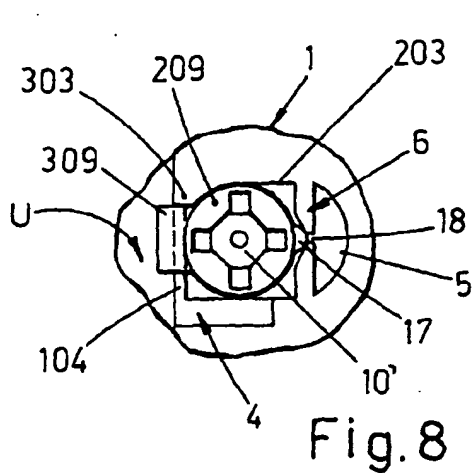
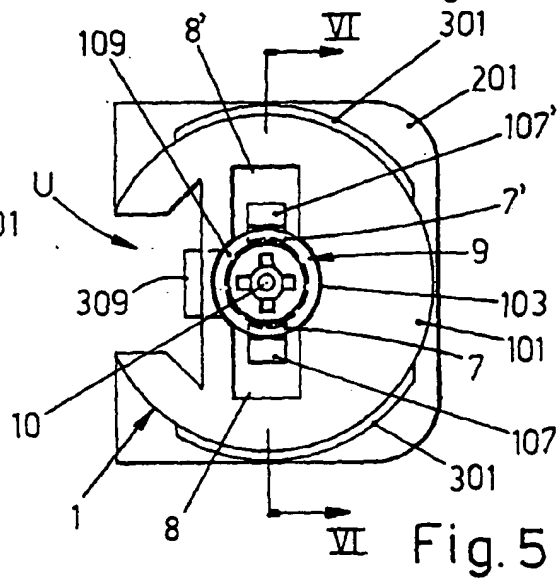
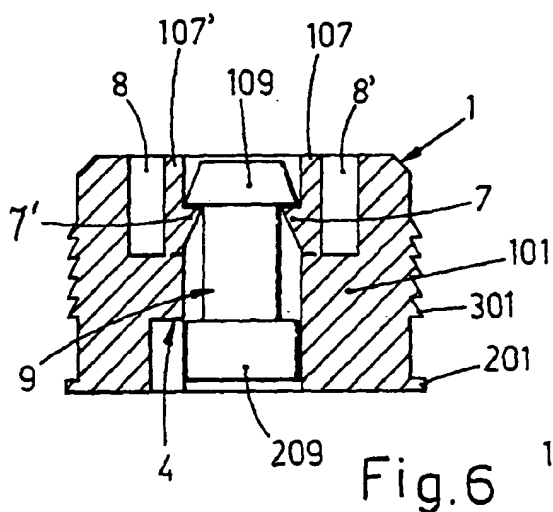
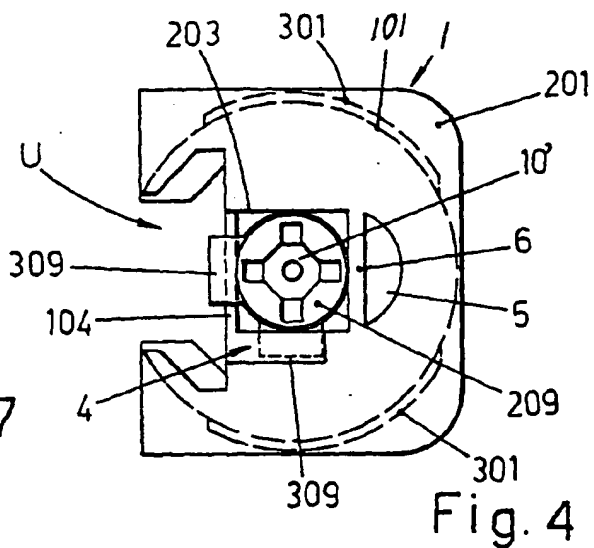
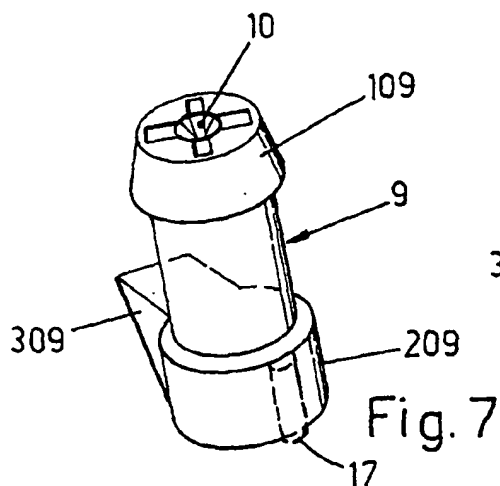


Fig. 2

Fig. 3





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 01 10 0632

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	DE 23 40 307 A (HUWIL WERKE GMBH) 20 February 1975 (1975-02-20) * the whole document *	1-9	F16B12/20 F16B12/26
A	DE 200 02 307 U (HETTICH HEINZE GMBH & CO KG) 6 April 2000 (2000-04-06) * page 7, line 10 - page 11, last line * * figures *	1-9	
A	US 4 127 353 A (BUSSE PETER) 28 November 1978 (1978-11-28) * column 3, line 46 - column 5, line 40 * * column 8, line 3 - column 9, line 8 * * figures 1-4, 20-28 *	1-9	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			F16B A47B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 20 August 2001	Examiner van Hoogstraten, S
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03.92 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 01 10 0632

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

20-08-2001

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
DE 2340307	A	20-02-1975	NONE	
DE 20002307	U	06-04-2000	NONE	
US 4127353	A	28-11-1978	DE 2625180 A	08-12-1977
			DE 2702643 A	31-08-1978
			AT 352330 B	10-09-1979
			AT 355677 A	15-02-1979
			BR 7703614 A	21-03-1978
			ES 459376 A	01-11-1978
			GB 1582761 A	14-01-1981
			IT 1080217 B	16-05-1985
			JP 53038466 A	08-04-1978

EPO FORM P0458

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82